DOCUMENT RESUME

ED 072 189 VT 018 431

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TITLE	Vocational-Technical Education and School District Organization.
INSTITUTION	Great Plains School District Organization Project, Lincoln, Nebr.
PUB DATE	28 Nov 67
NOTE	35p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Administrative Organization; Adult Vocational Education; Continuing Education Centers; Educational Needs; Out of School Youth; *Program Planning; *School Districts; Secondary Grades; *State Programs; Tables (Data); Technical Education; Vocational Development; *Vocational Education
IDENTIFIERS	Great Plains School District Organization Project

ABSTRACT

As a basis for establishing criteria for guidelines concerning effective and constructive school district organization in the four states of the Great Plains School District Organization Project, a past president of the American Vocational Association provided data on the purposes and organization of vocational and technical education for utilization by those with advisory or decision making responsibilities about the educational structure in each state. The following fields are discussed separately: (1) agriculture, (2) home economics, (3) business and office education, (4) distributive education, (5) trade and industrial education, and (6) technical education. These conclusions were reached: (1) Vocational and technical education, as essential parts of a modern public curriculum, should enroll from 500 to 1,300 secondary and out-of-school youth and adults in a vocational education center, (2) Vocational education programs deserve the support of business, industry, and the public, (3) Suburban and rural communities should join together to provide a sufficient student base and tax base for vocational education, and (4) Residential programs are preferable for sparsely populated areas, as opposed to a comprehensive program pattern for large cities. (AG)

ED 072189

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VOCATIONAL-TECHNICAL EDUCATION AND SCHOOL DISTRICT ORGANIZATION

by

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The State Department of Education
Columbus, Ohio

November 28, 1967

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VT018431

FORWARD

The impact of scientific, technological, social and economic change on the American way of life necessitate a re-examination of the educational system. These changes modify established needs and create new needs to be met by the public school system. Instructional programs and supporting services must be developed to meet these needs.

The primary purposes of school district organization are to make possible: (1) the desired quality or excellence of the programs and services; (2) the efficiency of the organization for providing the programs and services; and, (3) the economy of operation, or the returns received for the tax dollar invested in education.

Vocational-technical education at the high school and post high school levels is of major concern at local, state, and national levels. The direction for this phase of the total educational program, and the necessary structure to provide comprehensive vocational training opportunities to all youth, is in the emerging process in the United States. Dr. Byrl Shoemaker, Past President of the America Vocational Association, was invited to provide data and information for use in the four states as plans are made to develop guidelines for an appropriate school district organization structure in each of the four participating states.

The value of this paper rests upon its utilization by those with advisory and/or decision making responsibilities about the educational structure in each state. It represents a beginning point for further study and evaluation, and for establishing criteria upon which guidelines can be developed for effective and constructive school district organization.

Respectfully submitted,

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November 28, 1967

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VOCATIONAL AND TECHNICAL EDUCATION IN THE PUBLIC EDUCATION SYSTEM

INTRODUCTION

Throughout the Nation, there is a massive expansion in the area of vocational and technical education--a massive expansion, encouraged and supported by government, business, industry, school administrators, parents, and students. This growth of interest is indicated in the raw figures on growth of programs throughout the Nation.

In 1963 there was a total of 4,217,198 youth and adults of the Nation served by vocational education programs reported to the Division of Vocational Education in the U. S. Office of Education. Preliminary figures for the fiscal year just closing as of July 1, 1967 show an enrollment for that year of slightly over 7,000,000 youth and adults.

This phenominal growth in vocational education programs and the projected growth based on facilities already under construction, point to the fact that vocational education is being accepted truly as an important part of the total educational program and as one of the weapons in the war on social and economic problems that have faced every great civilization. The further growth of vocational education is predicted on the basis of the continuation of our technological evolution and the interest throughout our Nation in overcoming some of the social problems that no civilization has ever solved.

The growth in productivity during the industrial revolution was brought about by making men slaves to machines. The technological evolution which we are under going is freeing men from slavery to machines. The price of this freedom is increased knowledge and skills required to serve as master of the machines. The jobs that will be available in the world of today and tomorrow will be for people who "know something" and "can do something." A man who earns his living with his back is going out of business.

Our society is also determined to bring the benefits of that society to all citizens, including those who in previous societies have been assumed to be necessary evils. As efforts are made to integrate all people regardless of race, creed, or color into the mainstream of our economic life, it has become increasingly evident that education is a ladder from the pit of poverty for most of the unfortunate people, and that vocational education provides many important rungs on that ladder.

As vocational education becomes increasingly important in our economy and as increased efforts are made to bring the benefits of such programs to more youth and adults, it is important that careful consideration be given to the type of vocational education programs and the program organization which can best perform the tasks assigned to it.

This position paper suggests some principles and practices of vocational and technical education for the public education system.

IDENTIFYING VOCATIONAL AND TECHNICAL EDUCATION

The term"vocational education" and the term " technical education" often are used interchangeably in public education to describe the same types of

programs. Within the framework of this description, however, the terms will be used to describe companion programs, but programs which have different goals, different purposes, and serve different types of occupations.

There are no legal definitions as concerns these terms, so it cannot be said that anyone is using them incorrectly. However, if we want to talk about two different types of education, both related to occupations in business and industry, it is feasible to define these terms to identify these different levels.

A definition or description of vocational education concerned with skilled level occupations in the areas of construction, maintenance, repair, servicing, or production can be worded as follows:

The primary purpose of vocational education is to equip persons for useful employment. The program is designed to serve the needs of people in two distinct groups. First, adults who have entered upon, and second, youth and adults who are preparing to enter occupations in agriculture, business, homemaking, distribution, trade, and industrial fields requiring less than a college degree.

Vocational education helps to give definite purpose and meaning to education by relating it to occupational goals. It provides the technical knowledge and work skills necessary for employment; but, it is more inclusive than training for job skills. It develops abilities, attitudes, work habits, and appreciations which contribute to a satisfying and productive life.

Vocational education contributes to the general educational needs of youth, such as citizenship, respect for others, and acceptance of responsibilities; but, it makes its unique contribution in the field of the preparation for work. It is a part of a well-rounded program of studies aimed at developing qualified, efficient workers. It recognizes that the American worker should be competent--economically, socially, emotionally, physically, and in a civic sense.

The uniqueness of vocational education programs in our public schools is in their contribution to the skills and technical knowledge required for employment. Recognizing the needs of youth and adults for instruction in a field of occupations, no public high school or public school system can be classified as comprehensive unless the educational offerings include a comprehensive vocational education program to serve youth and adults.

Technical education, on the other hand, as the term will be used in this report, is concerned with design, development, testing, supervision, or mid-management functions. The technician does not replace the professional person or the skilled worker. The technician does, however, enable the professional person to work at his highest level of educational training by providing supportive services. The technician also enables the skilled worker to function effectively and economically through coordinative and interpretive functions served by the technician between the professional and the skilled worker.

Technical education is a new level of education in keeping with our technological revolution and the changing needs of both people and business and industry in our economy. This new level of education is planned to prepare para-professionals in two-year post-high school programs to support the professional people in engineering, business, agriculture, distribution, health, and public service occupations. Such para-professionals can be prepared in two-year post-high school technical education programs to work in a team relationship with both

the professional people and the people at the skilled or vocational levels of employment.

Both vocational and technical education may at times be lumped under the one term "vocational education" since the Vocational Education Act of 1963 and Title VIII of the National Defense Education Act, establishing Title III of the George-Barden Act, both include technical education as a part of the overall vocational education function. It is essential, however, that these two separate functions be identified clearly for one purpose--the curriculum, facilities, instructional materials, student goals, and minimum levels for successful achievement are normally different.

BASIS FOR VOCATIONAL EDUCATION

Even the early theorists in the area of education, while lacking the support of educational psychology, recognized and understood the need for an experience-centered curriculum. Rousseau, Froebel, and Pestalozzi all pointed toward the need to involve the children's ongoing experiences in life within the learning process.

During these early days, however, there was little necessity for vocational education, since the learning of work skills was a function of the family or the ongoing society in which they lived. The emphasis placed upon the importance of the relating of the child's home and work experiences, in terms of his school work, was based on the necessity of using such an experience base as support for the teaching of reading, writing, arithmetic, and other basic educational functions important to the changing society.

Essentially, John Dewey, one of our modern theorists in the area of education as he propounded his concept of learning by doing. The learning by doing theory founded by Dewey did not, however, fit easily into the subject-centered curriculum that had grown in our public schools. In too many cases, the interpretation was made that activity, however meaningless, would be a basis for learning, or to the acceptance of an extreme permissive concept of "What do you want to do today, children?" The educators who attempted to introduce the concepts of Dewey on these bases missed the whole point of the early leaders in learning theory, who deduced that the curriculum should be experience-centered--experience-centered in terms of things meaningful to the youth from the standpoint of either their goals or from the society in which they live.

The principles of learning developed as a result of educational experiments in clinical psychology support both the basic theses of the early educational theorists and the concepts of John Dewey. Some of the common principles of learning which serve as a basis for instruction in education, and certainly have a direct application in the field of vocational education are as follows:

1. We learn best when we are ready to learn. When we have a strong purpose, a well-fixed reason for learning something, it is easier to receive the instruction and to make progress in learning.
2. The more often we use what we have learned, the better we can perform or understand it.
3. If the things we have learned are useful and beneficial to us, so that we are satisfied with what we have accomplished, the better we retain what we have learned.

4. Learning something new is made easier if the learning can be built upon something we already know. It is best to start with simple steps which related to things we can now do or which we already understand.
5. Learning takes place by doing. Before the learning can become complete, we must put into practice what we are attempting to learn.

Vocational education is an experience-centered curriculum, accepting and making application of the basic principles of learning. Vocational and technical education are not disciplines, but they cut across and draw content from a number of disciplines and from the practical work of the world. The contribution of vocational education is the blending of theoretical knowledge from the disciplines with the practical experiences and requirements of entry jobs, recognizing the nature of the work of the world. In vocational and technical education we weave together the principles of mathematics and science, skills and technical knowledge into a mix which will help youth and adults to enter and adjust to employment opportunities or to upgrade themselves in their chosen field of work.

A preparatory program of vocational education is essentially a "core" program, built around the "pegged-core" concept of Dr. Alberty, Professor Emeritus, Ohio State University. The vocational and technical education programs take the students choice of occupation as the core of the program and build around this occupational choice the necessary skills, technical knowledge, work habits, attitudes, and job adjustment information necessary to enter employment in their chosen occupation upon graduation.

The principles underlying vocational and technical education, in terms of its goal to serve youth and adults and their needs in preparation for employment and the principles underlying the organization and operation of such programs, are educationally sound. While there have been some failures in the practice of vocational education, such failures have often been caused by a lack of acceptance of vocational education as an integral part of the total educational process and the sentencing of students in some centers to vocational education programs in which they cannot succeed. The large majority of the vocational education programs throughout the Nation have been successful in providing sound education to youth and adults.

The majority of the criticisms of vocational education tend to come from some major cities in which the facilities and equipment within their vocational programs have become antiquated. The occupational goals of the programs have not changed and broadened with the changing times, but the type of student enrolled has changed to the point where those enrolled cannot succeed in terms of the goals of the programs. Too often, these sad situations are the ones that gain the headlines instead of the large number of high-quality vocational programs operated under public education.

Annually, a follow-up study, in terms of placement of graduates is conducted in the State of Ohio, and a follow-up study was made in 1964 covering a four-year period of time involving graduates from vocational programs. Annually, the placement of graduates shows the viability of the programs, not only in terms of the overall placement, but also in terms of placement of graduates into the occupations for which they were trained. Only the field of agriculture shows a need for major changes in program orientation in relationship to job placement. The four-year follow-up study completed in 1964 showed that 95% of the graduates were employed and that 65% of the graduates were working in occupations utilizing directly the skills and knowledges learned in their vocational programs.

A study by the American Institutes for Research dealing with the subject "Vocational Education--The Process and The Product" summarizes the result of their studies covering 10,000 students in 30 States as follows:

"Vocational graduates get their first full-time job after graduation much quicker than do academic graduates. The average time to get a first full-time job for vocational graduates is less than six weeks. Fifty percent get their first full-time job within two weeks after graduation.

"Vocational graduates enjoy substantial greater employment security than do academic course graduates without college education. The median 1953-1962 graduate was 95 percent fully employed.

"Vocational graduates have greater accumulated earnings over the eleven-year period covered by the survey than do academic course graduates with no college education.

"About 50 percent of the vocational graduates enter into the trades for which trained or highly related occupations. Another 15 percent enter occupations that are somewhat related to the trade studied in high school.

"The percentage of vocational graduates who enter the trades for which trained rises and falls with the general level of the U. S. economy. In the recession year of 1958, only 28 percent of the graduates entered the trades for which they were trained.

"Negro vocational graduates have more difficulty getting their first full-time job, enjoy substantially less employment security, earn significantly less pay, and are much less likely to enter the trade for which trained than white vocational graduates. Fewer than 17 percent of the Negro graduates were able to get their first full-time job in the trade for which trained. (It should be noted that lack of enrollment is probably due to the lack of opportunity for employment for youth of the minority race in skilled occupations during the period of time covered by the study.)

"Of the vocational graduates who obtained jobs in the trade for which trained in high school, 50 percent reported they were 'exceptionally well prepared.' Another 45 percent reported 'on the whole, well prepared.'

"There is very little mobility among vocational course graduates. Less than three percent obtained their first full-time job by moving to another city. Eleven years after graduation, 87 percent still reside and work in the city in which they went to school. Another ten percent have made only one new city move in the eleven-year period.

"A comparison of vocational and academic graduates without a college education reveals no difference in conversational interests, leisuretime activities, and affiliation with community organizations. The findings contradict the contention that the vocational graduates are more poorly educated than academic graduates from the standpoint of education of the 'whole person.'

"While only 15 percent of the vocational graduates went to college, about 42 percent reported having had some type of formal post-high school education. Most attended private and public adult-level trade and technical schools and company courses."

A review also of the Manpower Development and Training programs which grow out of expressed needs for employment on the part of business and industry point to a high correlation between programs organized on this basis and the ongoing vocational programs called "traditional" within the public schools.

Every set of goals for education, starting from the seven cardinal principles of education, following through the ten imperative needs of youth and the developmental needs of youth as expressed by Havighurst, all have indicated vocational education as one of the goals of education for those youth who are not preparing for college. Preparation for a vocation has often been established as a goal of education, but ignored in terms of implementation in our secondary schools and post-secondary institutions.

Public education has continued to ignore the earlier maturity of our youth and the importance of goal-centered education for youth as they reach the important age of 16. We have recognized the need for changes in education at the point of their physiological change at age 12 or 13, but have failed to give consideration to perhaps the even more important psychological change at age 16. If you accept the premise that the theory underlying vocational education is sound, it then becomes a responsibility to look for practices implementing the theories.

ECONOMICAL BASIS FOR THE NEED OF VOCATIONAL EDUCATION

The industrial revolution brought on the new age of productivity, providing more goods and more services to more people. While this revolution relieved the backs of men from the drudgery of heavy labor, in many cases, the industrial revolution made men slaves to machines, with the men feeding the machines raw material and hauling off the completed work. While skilled occupations were always important and a skilled worker, except in the depression of the 1930's, was always in demand, the mass of unskilled and semi-skilled jobs within industry permitted youth the opportunity of graduating from high school, entering an unskilled job, and then living long enough on the unskilled job to the point where he could obtain a higher position or earn a living at the production type job.

Our economy is now undergoing a technological evolution in which man has become the master of the machine, rather than the slave. The price of this change is increased skill and technical knowledge in available jobs and the loss of the unskilled job. Secretary of Labor, Wirtz, made the challenge of the technological age clear as he made the following statement before a general subcommittee on education in the National Congress:

> "There was a place in the old work force for the boy or girl who left high school, either dropping out, or with a diploma in hand, and entered the work force with no skilled training. He or she could, and did take an unskilled job and worked up from there. Now, such jobs are vanishing, and so, today, there are 700,000 sixteen to twenty-year olds out of work and out of school. Every American youngster has to be given today, as a part of his education, some know-how about making a living, which means for a great many of them, vocational education."

A review of a June, 1965 report on unemployment in a midwestern State reveals that when the unemployment of males is considered by each category, the largest percentage of unemployment exists within the youth between the ages of sixteen

and twenty-four, and that the vast majority of the unemployed in this category are classed as unskilled workers. A study by the State Unemployment Service of the unemployed youth in this age range indicated that 89.4% of this group had absolutely no skills to sell to an employer. The facts point to the great need in the youth group for preparatory training for employment.

The need for upgrading courses for employed workers is in evidence, particularly for the worker thirty-five years of age or older. Both upgrading and retraining courses are important for the worker in the forty-five years of age and over category.

Looking at the pattern for women, we find again that unemployment is highest among the unskilled youth group. A review of the unemployed youth pattern would indicate that there is a need for training girls in occupations other than clerical and business occupations. Other occupations, however, such as cosmetology, dental assistants, medical assistants, laboratory assistants, and technical areas such as food service, food management, child care, etc., should be given consideration for the training of girls and women.

A study of the employment pattern within one midwestern State indicates that in the 1960 census, 7.6% of the jobs in the work force were classes as professional, requiring a baccalaureate degree or higher in the field of education. This analysis of jobs available matched the study of the census data which indicated that 7.2% of the adults above the age of twenty-one had a baccalaureate degree from a college or university. While projections would indicate that the 7.6% of professional jobs in our work force would increase to 11-12% by the 1970 period, simple arithmetic would indicate that 88% of our people are going to be employed in jobs which do not require a baccalaureate degree.

A further study dealing with student educational patterns within this same midwestern State reveals that for every 100 students entering the first grade, 75 will graduate from the ninth grade, 32 will start to college, and 14 will finish college. The 14 finishing college may be the most important in terms of our economical and cultural growth, but the other 86 also are important to our economy and our democracy. Vocational and technical education is concerned with the 86% who will enter employment without a baccalaureate degree.

It is a professional person's desire and an administrator's obligation to project his plans as far in the future as possible. It is difficult, however, to talk now about the preparation of youth and adults for jobs to be available in 1980. It is true that for some the academic studies will enhance their chances for employment. The problem, however, is stated succinctly by Grant Venn in the book entitled, Man, Education and Work, published by the American Council on Education.

> "Their assumption seems to be that the best and only necessary preparation for a job today is the longest possible immersion in academic and professional subjects.
>
> "This assumption at once fails to heed the factor of youth unemployment and misapprehends the relevance of general education. The liberal or academic studies do enhance the long-range civic and occupational competence of a person; they do not, at least below the baccalaureate degree level, and as a rule, qualify young people for meaningful job entry. The technological work world is one of specialization and sophisticated skills, and being a 'bright young man' cuts relatively little ice with employers looking for skills to do

some specific kind of work."

It is impossible for those of us in vocational education to project the job pattern in 1980. It is within our range of abilities, however, to provide for sound entrance programs today, and to encourage a flexible curriculum, flexible facilities and flexible program offerings for those vocational education programs now functioning within our individual States.

Vocational education is not the total answer to the overall unemployment problem brought about by cyclical and structural changes in our employment pattern. Vocational education is one of the answers for the unemployed persons who wish to reenter the labor market and for those in high school or post-high school levels preparing to enter the labor market for the first time. I would predict that when the answer to unemployment is found, vocational education will have a prominent part in the solution. This prediction is based upon the concept that the new technological evolution, brought about by automation, has placed a premium upon preparation in skills and technical knowledge for new jobs and has diminished the need for the unskilled worker.

As the governmental unit in our society works frantically to develop a "Great Society" a greater and greater reliance is being placed upon the concept of education as the only ladder out of a continuous poverty cycle.

AREAS OF VOCATIONAL EDUCATION

Agriculture

Vocational agriculture education offered in the high schools and area vocational schools and technical agriculture education offered at the technical institutes provide a source of trained people necessary for the agriculture industry of a State. Vocational agriculture education is offered in most rural schools. Specialized programs in horticulture, agricultural equipment mechanics, and non-farm agricultural business and service often can be made available only in area vocational schools and in some of the area vocational centers of our major cities. The teaching of skills, knowledge and abilities necessary for employment in production and non-production agricultural occupations is available to both high school and post-high school students. The high school program through organized class instruction, laboratory experience and supervised occupational on-the-job experience provides the student with the basic principles in agricultural production, mechanics, management and leadership. The specialized technical and related instruction given to the 11th and 12th year students prepares the students to enter semi-skilled and skilled occupations in agriculture, including farming.

The adult programs in vocational education and agriculture includes organized instructional programs for young and adult farmers and others who engage in non-farm agricultural occupations. Manpower programs are conducted for training and retraining individuals for production and non-production agriculture. Special emphasis is often given to the young and adult farmer programs in the area of farm business planning and analysis from which management decisions are evolved.

Home Economics

Vocational home economics today has two purposes in education, 1) to train for homemaking and family living, and 2) to train for occupations directed toward gainful employment. The major areas of homemaking instruction at the secondary level include: personal and family relationships; home management; consumer competence and responsibility; care and guidance of children; selection and care of the house and its furnishings; clothing for individuals of the family; and, food for the family.

The programs assist women in carrying out their dual role of homemaker and wage earner through services of the adult education program. Through such adult programs, parent education is provided for both men and women.

The training of youth and adults for wage earning occupations under vocational home economics which require home economics knowledge and skills and lead directly to employment is another function of the program. Such training programs prepare persons to be child care workers, clothing service workers, food service assistants, homemaker's assistants for homes and nursing homes, etc. Wage earning programs in home economics are developed at the secondary, adult, and technical levels.

Business and Office Education

Business and office education programs have been common in the public schools from the junior high school on through. Too often, however, such programs have been a combination of personal use, practical arts, or exploratory functions and only a limited effort at vocational preparation. A major effort in most such business programs has been in the area of stenography.

Vocational business and office education programs can be established normally for the last two years of high school and in post-high school technical centers to prepare youth and adults for entrance into employment or upgrading into a higher level job.

Vocational business and office education programs are being developed based upon occupational goals of the students and providing sufficient depth for preparation for entrance into employment. Seven vocational areas have been identified in the field of business and office education, providing opportunities for vocational training in this field in keeping with different interests and different ability levels. Six vocational areas are: bookkeeping, clerical, office machines, data processing, secretarial, and stenographic.

As in all areas of vocational education, all of the technical education level programs are at the post-high school centers.

Distributive Education

The distributive education program is concerned with the preparation of people for employment in the areas of retailing, wholesaling, or service. Such programs are normally organized as cooperative programs and offered to juniors and seniors in the public schools as a service to high school students. In such cooperative programs, the students spend one half of the day in school and one half of the day working in a business establishment in an occupation relating to the distribution of goods or services. In school, the student spends two periods studying merchandising and marketing and completing the school subjects required for graduation.

Post-secondary technical and adult programs are offered in the field of distributive education. The post-secondary technical programs emphasize management areas of retailing and wholesaling, and other areas such as hotel and motel management, food service, etc. Short courses are offered for adults for purposes of upgrading and retraining of those employed in the field of distribution or for those who wish to enter the field.

Trade and Industrial Education

There is virtually no limit to the kind of programs that can be offered in the areas of trade and industrial education. The imagination of the educator, the vocational interests of the students, and the needs of employers for a skilled work force are the only determining factors in the types of programs offered. Trade and industrial education is a balance of study and work experiences. This program develops the skills, technical knowledge, understandings, and work habits needed by individuals who desire to enter and make progress in employment. It is of paramount importance that business, industry, and the public be made aware of this type of education and give active support for its further development.

Some of the common areas of trade and industrial education for the high school level include: machine trades, auto mechanics, basic electricity and electronics, mechanical drafting, printing, welding, sheet metal, bricklaying, carpentry, plumbing, and cosmetology.

Post-high school technical education programs fall in the area of those supporting the field of engineering. Upgrading courses are offered in trade and industrial education to employed workers, and preparatory programs are provided for out-of-school youth and adults wishing to enter or reenter the labor market.

Areas specifically related to public service falling under the area of trade and industrial education include fire service training, emergency and rescue training, custodial training, law enforcement training, school bus driver training, and health occupations. In many States the health occupations may fall under the broad area of trade and industrial education, since the original health occupations programs grew out of the broad concept of public service training in the field of trade and industrial education.

Health occupations training is offered on the skilled or vocational level in both the high school and post-high school programs, including preparatory and upgrading training. Post-high school technical programs also are provided in health occupations. Some of the common vocational programs in the area of health occupations at the vocational level include practical nursing, dental assistants, medical assistants, X-ray assistants, physical therapists assistants, etc. Associate degree programs for registered nursing would be included as post-high school technical programs in health occupations.

Technical Education

Throughout this paper, reference has been made to technical education as an integral part of a total vocational and technical education program, and reference has been made to technical education as a post-high school program relating to the broad occupational areas. There is an evident need throughout

the Nation for an expansion of this relatively new field in education, an area of education more practical than the professional, and more theoretical than the craftsman; an area of education worthy of a unique position within the pattern of education--not a watering down of professional education, and not an upward extension of vocational education; a unique level of education to prepare for new levels of employment in business, industry, agriculture, distribution, health, and the social sciences to prepare persons to work as para-professionals in a team relationship with a professional. This need is based upon the concept of the increasing requirements in the professional field, changes of assignment in the professional field, and the shrinking number of professional persons per thousand of population.

Technical education is a level of education that is growing in keeping with our technological evolution and with the changed needs of both people and business and industries in our economy. This level of education is Planned to prepare para-professional people in two-year post-high school programs to support the professional people in engineering, business, agriculture, distribution, health, social science, and other public service occupations. Such para-professionals can be prepared in two-year post-high school programs to work in a team relationship with both the professional people and the people at the skilled or vocational levels of employment.

Technical education is concerned with design, development, testing, supervision, or mid-management functions. The technician does not replace the professional person or the skilled worker. The technician does, however, enable the professional person to work at his highest level of education and enables the skilled worker to function effectively and economically through coordinative and interpretive functions served by the technician between the professional and the skilled worker.

Examples of the team relationship of the technical level of employment are as follows:

A. Industrial

Professional - Mechanical Engineer
Technical - Tool and Die Designer
Skilled - Tool and Die Maker
Semi-Skilled - Drill Press Operator

B. Business

Professional - Accountant (College Graduate)
Technical - Business Data Computer Programmer
Skilled - Unit Record Operator
Semi-Skilled - Clerk

The possibilities for program development in the field of technical education are limitless. Wherever there is a profession, and wherever the profession will accept a para-professional, two-year post-high school technical programs can be organized to prepare such para-professionals.

PURPOSES OF VOCATIONAL EDUCATION

As indicated earlier, the unique function of vocational and technical education in the total pattern of education is to prepare youth and adults for

employment. The concept of preparing a person for employment, however, now must go beyond the concept of providing skills and technical knowledge necessary for entrance into employment. Vocational and technical education must accept the concept of their role as preparing persons for employability. Skills and technical knowledge are essential and basic to employment, but our modern society places additional demands upon the person desiring to enter business and industry.

These additional concerns involve literacy, mental and physical health, work habits and attitudes, interpersonal relationships, motivation, and acceptance of citizenship responsibilities in his place of employment and in his community.

Since the original vocational education act in 1918, vocational education has assumed a responsibility for services to different age levels of students. Skill level programs were offered for high school youth in the areas of agriculture, distribution, homemaking, and trade and industrial education. For those students with average or better I.Q.'s, post-high school vocational programs were offered on a preparatory basis, but such programs have not been as numerous as the vocational programs for high school youth, even though our changing patterns of employment and growing unemployed group in the ranks of the unemployed propose a social problem. Additionally, vocational education has served in a commendable manner the employed adults who need instruction for upgrading and apprentices who need related technical instruction. Vocational education, however, tended to ignore the needs of the less able students, the needs of the unemployed adults, and the need for a massive expansion of vocational education opportunities in a variety of occupations.

The Vocational Education Act of 1963 and the Manpower Development and Training Act of 1963 both pointed the way toward a broad expansion, in not only the numbers enrolled in vocational education, but also in the responsibilities to be assumed by public vocational education if it is to prevent the establishment of a national system of vocational education.

Under the National Defense Education Act of 1958, which predated the two acts mentioned above, vocational education was given the impetus to expand the area of post-high school technical education for the more able out-of-school youth and adults. Vocational education accepted this responsibility to add this very desirable program to the vocational education offerings without a question.

The two 1963 acts mentioned above directed vocational education to be more concerned with the underprivileged, the unemployed, and the disadvantaged people in terms of the great social needs of our modern economy. Vocational education, therefore, now has the responsibility of serving socially and economically deprived students, the less able and the underachievers, the average students, and the above average students. Vocational educators have been directed to have a concern not only for the skills and technical knowledges of youth, but also to the physical, mental, social, economical, and educational needs of youth and adults.

One State Superintendent of Public Instruction placed the challenge before his Division of Vocational Education staff in this manner: "Yes, I know that you cannot enroll low ability students in a high-skill vocational program; but my challenge to you is to develop a vocational program to meet the needs of the less able student." The opportunity to serve the socially and economically disadvantaged students and the less able and underachieving students provides a challenge to the field of vocational education. With State and Federal funds providing the flexibility for programming, including the opportunity to provide paid employment under the work-study program of the Vocational Education Act of 1963 to those students who need money to stay in school. many States are making progress in the

establishment of programs planned specifically for this group. Such programs are based on preparation for occupations within the ability and interest range of the group to be served. Programs planned for the less able and underachievers normally point toward the semi-skilled or single-skill occupations and are identified as occupational level programs so as to place them in a proper perspective with the vocational skill level and the technical level programs.

Experiences with dropouts enrolled voluntarily in a residential center established with the help of manpower development and training funds at the Youngstown Air Force Base, near Youngstown, Ohio, revealed the fact that over 50% of such dropouts had measurable physical rehabilitation problems that had never been considered during the school career of the youth. As a result of this finding, an effort is being made to establish a rehabilitation evaluation unit in cooperation with each area vocational school established in Ohio.

Experiences with a work laboratory giving work experiences to less able youth prior to placement in business and industry on a semi or single skill occupation, combined with the concepts learned at the residential center referred to above, has given birth to a concept of a center for school disoriented youth for the major cities in Ohio. Plans for the center envisions a program oriented heavily toward the concept of rehabilitation.

The purposes established for vocational education are broad enough to be concerned with the needs of any youth or adult desiring preparation for employment, retraining for reentry into the labor force, or upgrading for the employed worker who faces new tasks or wishes to prepare for advancement. The only limitations to the breadth of services of vocational and technical education are interest, ability to plan, innovate and implement new programs, and the availability of sufficient dollars to do the job.

The job of vocational education is not only to teach knowledge and skills, but to prepare youth and adults for employment.

QUALITY AND QUANTITY IN VOCATIONAL EDUCATION

Quality

The concept of flexibility is important in the area of vocational education, in terms of curriculum, facilities, and program offerings. But, this term should not be used to imply a concept of lowering the investment of time by students in a program of vocational education in order to enhance his opportunities to enroll in the college preparatory courses of mathematics and science and other related disciplines, There is a real question as to whether this type of flexibility improves either the vocational education or the ability in mathematics and science.

The Division of Vocational Education in Ohio, in cooperation with the Ohio State University, has completed two research studies involving the question of depth of training for students enrolled in vocational education. From the one study, it is evident that students enrolled in depth programs of vocational education in the trade and industrial field achieve significantly higher scores on trade achievement tests than did those students who enrolled in programs

requiring less of the students' time for vocational education and making available a greater portion of the students' time for liberal and academic studies.

A further study of the report reveals that students enrolled in a more flexible program, requiring less time in vocational areas, do not achieve more in the areas of mathematics and science than those who enrolled in depth programs of vocational education. To the contrary, those students who remain enrolled in depth programs of vocational education requiring instruction in the math and science related to their trade showed a significantly higher achievement in the understandings of principles of mathematics and science than did the students in the so-called "flexible programs." Too often, the value of sound vocational education programs to the total educational process has been adversely attacked by those with the concept that a college preparatory program is the "general education" curriculum that all students can and should follow.

The contribution of vocational education to the total curriculum is alluded to by Dr. Conant in the January issue of "Changing Times." Dr. Conant was asked the question, "Dr. Conant, suppose that one or more of the children in a family are not interested in going to college?" His answer was, "Along with its academic courses, the high school should offer a vocational program. Thus, a boy could develop an occupational skill which would interest him, such as automobile mechanics, tool and die work, or carpentry. This would also stimulate him to learn mathematics, history, social studies, and English, since he now would see the point of it all. Girls might take such courses as stenography, typing, or home economics."

The research study reported earlier as conducted by Ohio State University has indicated that for students other than the college bound, interest and achievement in the areas of mathematics and science can be encouraged by the following conditions:

1. The instruction is a required part of the vocational program.
2. The instruction is provided in a block of time separate from the skill instruction, but correlated with such skill instruction.
3. The students are taught in homogeneous groups according to the occupational area in which they are enrolled (i.e. machine trade, auto mechanics, etc.).
4. The principles of science and functions of mathematics should be taught in relation to the real problems in the occupation for which the student is preparing.
5. The principles of science and the functions of mathematics are selected on the basis of applicability to the occupational area and taught at the "applied" rather than at the "proof" level.

A report from one major city indicated that less than 15% of the students were enrolled in the higher mathematics and science courses at the eleventh and twelfth year levels. A much higher percentage of the students need mathematics and science following graduation. Not all students need the "proof" type of mathematics and science provided in the college preparatory mathematics and science courses. The students who are not going on to college do not have the goal orientation necessary to encourage success in the college prep classes, and many do not have the aptitude or ability to succeed.

Often, a next attempted solution is the establishment of general, shop, or applied mathematics courses which place all students not in the college preparatory courses in classes together with all vocational students in such common classes. The history of such courses has been poor. The goal orientation in

such classes is no more clear for students not planning to go on to college than the college preparatory courses, even though the content may be functional or applied. Functional in what way? Applied to what? What does the boy in an auto mechanics vocational program or the boy in vocational agriculture care about the functions of trigonometry as applied to the machine trade? As a matter of fact, why should the boy in auto mechanics be required to learn to use the functions of trignometry? Unused knowledge is soon forgotten, and the auto mechanics student has no use for trignometry.

Vocational education should not be considered primarily as a means to teach principles of mathematics and science, but as a program which includes instruction in such principles as a means of reaching a goal of preparing students to live and to earn a living.

Quantity

Vocational programs prepare students for entrance into a family of occupations, not into "a" job. As an example, vocational training in the auto mechanics field would be basic to approximately 750 of the jobs listed in the occupational handbook. A comprehensive program will offer a wide variety of programs to meet the interests and abilities of students at the high school level and the out-of-school youth and adults.

In the development of a Master Plan for Vocational Education in Ohio, C. O. Tower, Supervisor of Research and Surveys, Division of Vocational Education, developed the following facts concerning the size of a vocational program.

He suggests that at least three factors should be considered: (1) breadth of program, (2) costs, and (3) pupil travel time. Table 1:--Recommended Minimum and Optimum Enrollments for Vocational Schools, presents the number of programs in each of the vocational areas for recommended minimum and optimum size vocational school. It also presents normal and maximum enrollments for such centers. Table 2--Size of Joint Vocational or Intermediate Districts for Recommended Vocational Schools, presents pupil populations of such districts to produce the enrollments for recommended minimum and optimum size vocational schools. Item "2" assumes that approximately 33 1/3% of the graduating class continue to post-high school higher education and that vocational education will be provided in grades eleven and twelve for 50% of the non-college bound. Item "3" is 8.2 times item "1". This is the ratio of total enrollment, K-12, to grades eleven and twelve. Item "3" is the needed pupil population of a joint vocational or intermediate district for a minimum vocational school and the size of the district which can justify an optimum scope of vocational offering. Joint vocational or intermediate districts can serve a larger student body but should consider more than one vocational center as the school district student population approaches 70,000. This would produce two vocational schools of approximately 1400 pupils each.

Minimum Enrollments

Table 3:--Recommended Vocational Programs and Related Information for Illustrative Schools of Various Sizes, summarizes the number of programs, capital outlay per pupil and operating cost per pupil for each school.

Table I

RECOMMENDED MINIMUM AND OPTIMUM ENROLLMENTS FOR VOCATIONAL SCHOOLS

Vocational Areas	Minimum Size School			Optimum Size School		
	No. Different Programs	Enrollment		No. Different Programs	Enrollment	
		Normal	Maximum		Normal	Maximum
Agriculture Education	2	70	100	6	210	300
Business Education	3	120	150	9	360	450
Distributive Education	1	20	30	3	60	90
Home Economics Education	1	40	50	3	120	150
Trade & Industrial Education	5	200	250	15	600	750
TOTAL	12	450	580	36	1350	1740

Table 2

SIZE OF JOINT VOCATIONAL OR INTERMEDIATE DISTRICTS FOR RECOMMENDED VOCATIONAL SCHOOLS

Item	Minimum Population	Optimum Population
1. Vocational Pupils From Table I	580	1,740
2. Total Pupils Grades 11 and 12	1,740	5,220
3. Total Pupils Intermediate School District	14,268	42,804

Table 3

RECOMMENDED VOCATIONAL PROGRAMS AND RELATED INFORMATION FOR ILLUSTRATIVE SCHOOLS OF VARIOUS SIZES

Item	Pupil Enrollment							
	408	620	1,004	1,379	1,719	2,109	2,339	2,779
1. Enrollment ÷ 50[1]	8	12	20	28	34	42	47	56
2. Number Different Programs	15	16	22	27	33	36	39	41
3. Capital Outlay Per Pupil	$3,994	$3,136	$2,858	$2,589	$2,500	$2,453	$2,415	$2,363
4. Operating Cost Per Pupil	$ 519	$ 517	$ 480	$ 479	$ 477	$ 474	$ 478	$ 467

[1]Maximum number of programs for pupil enrollment with full utilization of building.

Most shops and laboratories can accommodate fifty pupils in two sections. A drafting room can accommodate sixty pupils, but a cosmetology laboratory can accommodate only forty. Therefore, if we divide the enrollment of a vocational school by fifty, we will obtain the approximate number of different programs that the pupil population can support with full utilization of the facilities; see item "1", table 3.

Start with a school enrollment of 1,379, see table 3. The enrollment divided by fifty gives twenty-eight programs. The table further shows that as the schools become smaller, the different programs which the enrollment will support decreases to 12 then 8. As schools become smaller, the breadth of the program must be reduced to those common areas of training with greatest employment. In order to minimize this reduction in the breadth of programs in the illustrative schools of less than 1,379 enrollment, class size has been reduced and grade levels combined. This consequently reduces the utilization of the building and increases the capital outlay per pupil, $2,589 - $2,858 - $3,136 - $3,994, and operating cost per pupil, $479 - $480 - $517 - $519. As we go below an enrollment of 620 pupils, in the vocational center, a satisfactory breadth of program can be maintained only by increasing the cost.

Optimum Enrollment

Table 3 also shows that, as schools become larger, the number of different programs, see item "2", increases 33, 36, 39, then 41. The enrollment divided by fifty produces more programs, 34, 42, 47, then 56, than are offered in the illustrative schools. As schools become larger, the breadth of the program can increase into those areas with lesser employment. Although the increased enrollment gives sufficient program selection by pupils to justify opening new courses, it also increases program selection by pupils to more than one shop in the more common areas. Therefore, duplicate programs must be added. As we move upward and pass enrollments of 1,719, the breadth of programs does not increase in proportion to enrollment increases and the capital outlay per pupil $2,453 - $2,415 - $2,363 and operating costs $474 - $478 - $467 are reduced very little.

Vocational education pupils travel additional time from resident school to joint vocational school. Since they ride to resident schools with other students, this extra transportation must be taken from class time. Class schedules of vocational pupils should not be reduced more than one hour per day. It appears that a vocational school of more than 1,700 pupils reduces costs very little, adds new programs in areas not offered by smaller schools but not in proportion to increased enrollments.

Conclusions

Mr. Tower suggests that the minimum enrollment for a vocational school should be approximately 600 pupils and consequently a joint vocational or intermediate district of approximately 15,000 students in order to give an acceptable vocational program. It also appears from this study that little is gained by increasing the enrollment above 1,700, which would have a corresponding joint vocational or intermediate district of approximately 42,000 pupils. It should be kept in mind, however, that a joint vocational or intermediate district does not have limiting factors by being larger than 42,000 that it does by being smaller than 15,000 as it can operate two vocational schools.

Table 4

PROGRAMS ILLUSTRATIVE OF VOCATIONAL OFFERINGS IN JOINT VOCATIONAL SCHOOLS BY SIZES

Vocational Education Programs	Enrollment							
	Additional enrollment usually provides greater breadth of offerings					Additional enrollment usually does not provide greater breadth of program		
	408[2]	620	1004	1379	1719	2109	2339	2779
TOTAL: Vocational Education	15	16	24	31	39	46	50	58
Agricultural Education								
Agriculture Business	X	X	X	X	X	X	X	X
Agri. Equipment & Mechanics				X	X	X	X	X
Agriculture Processing					X	X	X	X
Agriculture Production	X	X	X	X	X	X	X	X
Forestry Conservation					X	X	X	X
Horticulture		X	X	X	X	X	X	X
Business Education								
Account Clerk Bookkeeper			X	X	X	X	X	X
Clerical Services--DAVY							X	X
Cooperative Office Education	X	X	X	X	X	X	X	X
Entry Business Data Processor	X	X	X	X	X	X	X	X
High Speed Stenographer				X	X	X	X	X
Medical-Dental Clerk Steno.								X
Off. Dup. Reproduction Spec.						X	X	X
Office Machine Operator					X	X	X	X
Senior Intensive Core	X	X	X	X	X	X	X	X
Distributive Education								
Distributive Education	X	X	XX	XXX	XXXX	XXXXX	XXXXXX	XXXXXXX
Home Economics Education								
Child Care Aide 1-year or								

PROGRAMS ILLUSTRATIVE OF VOCATIONAL OFFERINGS IN JOINT VOCATIONAL SCHOOLS BY SIZE[1]

Vocational Education Programs	Enrollment							
	408[2]	620	1004	1379	1719	2109	2339	2779
Child Care Assistant 2-year.....	X	X	X	X	X	X	X	XX
Clothing Service 1 or 2-year . .						X	X	X
Food Service 1 or 2-year. . . .			X	X	X	X	X	X
Home Makers Assistant 1-year or Aide for Nursing and Rest Homes.	X	X	X	X	X	X	X	X
Trade and Industrial Education								
Industrial Maintenance Mech. . .								X
Industrial Lab Assistant							X	X
Small Engine Repair.							X	X
Appliance Repair					X	X	X	X
Automobile Body Repair			X	X	X	X	X	X
Automobile Mechanic.	X	X	X	X	X	XX	XX	XX
Architectural Drafting	X	X	X		X	X	X	XX
Mechanical Drafting.				X	X	X	X	XX
Carpentry.			X	X	X	X	X	X
Commercial Art				X	X	X	X	X
Cosmetology.	X	X	X	X	X	XX	XX	XX

PROGRAMS ILLUSTRATIVE OF VOCATIONAL OFFERINGS IN JOINT VOCATIONAL SCHOOLS BY SIZE[1]

Vocational Education Programs	Enrollment							
	408[2]	620	1004	1379	1719	2109	2339	2779
Commercial Food Production.			X	X	X	X	X	X
Dental Assistant.				X	X	X	X	X
Electrical.	X	X	X	X	X	X	X	X
Electronics and T.V..				X	X	X	X	XX
Fabric Service.						X	X	X
Machine Shop.	X	X	X	X	X	XX	XX	XX
Metal Fabrication	X				X	X	X	X
Welding		X	X	X	X	X	X	X
Printing.			X	X	X	X	X	X
Diversified Coop. Training.	X	X						
Occupational Work Experience. . . .			XX	XXX	XXXX	XXXX	XXXX	XXXX

[2]This scope of program cannot be offered economically on the basis of this number of students. Most facilities are used half time.

[1]Program offerings in a Joint Vocational School are designed to meet pupil as well as local, state, and national labor needs. Therefore, it must be understood that a school may or may not offer some listed course(s). Moreover, these tabulations are not to be construed as minimum program requirements, nor that a school of a certain size must offer only these programs. It must further be understood that each school is evaluated upon the degree to which the program(s) satisfy the needs of the pupils, the community, and local, state, and national labor needs.

In looking at the area post-high school technical education programs, the Ohio Board of Regents also indicated that a viable technical education program would enroll no less than 500 students in order to economically provide the minimum comprehensiveness of program. A sample minimum scope program in technical education might include:

A. Engineering
   1. Mechanical Technology
   2. Electronic Technology
   3. Chemical Technology
   4. Metallurgical Technology
   5. Civil Technology

B. Health
   1. Dental Laboratory Technology

C. Business
   1. Computer Programming Technology
   2. Junior Accounting Technology

D. Distribution
   1. Retail Mid-Management Technology

E. Agriculture
   1. Agriculture Business Technology

No studies have been made to indicate either the optimum size or maximum size in relationship to post-high school technical education units, since this area is still in its developmental stages within most States. Studies suggest, however, that even the minimum comprehensiveness in technical education identified above could be supported only in population areas of not less than 75-100,000.

ORGANIZATION FOR VOCATIONAL AND TECHNICAL EDUCATION

Vocational Education

Outside of our large cities very few school districts as they are now constituted in most of our States can offer a comprehensive program in vocational education. As indicated in the previous section, studies would indicate that a minimum of 500 students should be enrolled in vocational education programs in order to provide for a minimum scope of offerings. Experiences in Ohio would indicate that the enrollment of 500 students in vocational education at the eleventh and twelfth grade level would require an enrollment of 1500 students in the upper two grades of the school or schools participating in the vocational programs. Likewise, to meet a desirable program as outlined in the previous section, enrollment of 1300 students in a two-year program would require an enrollment of 4,000 students in the upper two grades of the high school. A vocational program is dependent upon its breadth in order to reach the different interests and ability levels of the students. The opportunity to provide this breadth is based upon:

1. The availability of sufficient tax base to support the necessary construction, equipment, and operation.

2. A sufficient student base to provide an economical enrollment in the individual programs offered.

Experiences in Ohio have indicated that area centers can be established to serve a number of school districts with the area centers serving as an extension of each of the participating schools. Under this plan, students in the last two years of their public school experience may enroll in the vocational center on a full-time basis, but continue their registry and official relationship with the local school district. The students are officially members of the school districts participating in the area centers and may play athletics and participate in extra curricular activities. Students graduate from the local school district, rather than from the area vocational school. A pattern of taxation provides for the funding of local tax levies and bond issues in the same manner as they are voted by other school districts, even though the area school district is superimposed over that of the participating school districts. On the basis of the broad tax base gained by the joining together of a number of districts, the tax rate for construction and operation normally will run someplace between two to three mills on the total tax.

Experience within one mid-western State would indicate that joint vocational school districts can include an area measured in time of travel of thirty to forty minutes from the farthest home school to the area vocational center. Experience has indicated that joint vocational school districts can provide many services to the participating districts. In addition to that of vocational education programs for out-of-school youth and adults, and in some cases, serve as a center for post-high school technical education. The area vocational school becomes a center for not only high school youth, but also for retraining of unemployed out-of-school youth and adults, and upgrading instruction for employed workers.

In sections of many States, it is impossible to bring together sufficient students from the high school level to provide even a minimum comprehensiveness in the field of vocational education. In these cases, the travel distances make daily commuting an impossibility.

There is no evidence or experience which indicates that mobile units can do more than orient students to occupational areas. Mobile units can neither provide the type of equipment or the breadth of equipment necessary to prepare for adequate entrance into a vocation. Likewise, the amount of time a mobile unit would be available to a school would not give the opportunity to develop any depth of skill or technical knowledge.

In areas of such sparse population, consideration must be given to residential centers at either the high school or post-high school level.

Large cities of 200,000 population or over normally can offer a comprehensive vocational program without joining with other school districts. Some organizational patterns for vocational education in the larger cities and their strengths and limitations are as follows:

I. <u>A series of vocational high schools, with broad programs corresponding to the needs of the students, with the district high schools providing limited vocational education programs, such as distributive education.</u>

The areas of vocational education included in each district high school would need to be limited to those areas in which the possibilities for employment are adequate within the city or region for the number that would be pre-

pared. In both the vocational high school and in the district high schools, the vocational programs would be limited to the eleventh and twelfth years, or the last two years of a student's school career.

A. Strengths
   1. Provides administration by people highly qualified to direct vocational education activities.
   2. Provides economy of equipment and facilities.
   3. Recognizes vocational education programs as an important field of education not to be delegated to secondary citizenship.
   4. Provides direct relationships with business and industry.
   5. Serves the needs of out-of-school youth and adults, as well as the needs of high school youth on an economical and effective basis for day, late afternoon, evening, or night programs, since vocational education areas are concentrated.
   6. Develops a necessary emotional state of belonging to, a pride in, and a satisfaction of participating in extra curricular activities within the vocational high school.

B. Possible Limitations
   1. Affects the entrance into certain colleges for a few students due to the lack of certain college preparatory offerings in the curriculum such as foreign languages.
   2. Separates students planning to enter employment upon graduation from those planning to enter college upon graduation.
   3. Enrolls qualified youth in proportion to the understanding that administrators have of vocational education and to the encouragement of qualified youth to attend.

Item three is a limitation only when administration of the school system does not understand the place of vocational education in the total program, and, therefore, has not provided the necessary administrative relationships and in-service teacher education so that professional personnel will encourage students to enroll in vocational high schools on the basis of goals, interests, and abilities.

II. Vocational education service centers offering vocational programs and enrolling students from a number of district high schools in the eleventh and twelfth years, or the last two years of a student's school career.

Under such an arrangement, each of the district high schools would offer areas in vocational education as described in "I". Under this organizational pattern, schools could be organized either on a pattern such as 6-4-2 or pupils could be encouraged to enroll in the vocational education service center at the beginning of the eleventh year on the basis of needs and interests. Under this arrangement, the students could either become members of the vocational education service center or remain members of the district high school for purposes of extra curricular activities, sports, and graduation.

A. Strengths
   1. Provides more effective use of expensive equipment and facilities than the vocational high school, because the facilities and equipment are used only by students enrolled in the vocational program and not by pre-vocational students in the ninth and tenth grades of a vocational high school.
   2. Provides possibility for students participating in such vocational education service centers to take the required academic subjects at the vocational service center or in their district high school.

3. Provides administration by people highly qualified to direct vocational education activities.
4. Provides direct relationships with business and industry.
5. Serves the needs of out-of-school youth and adults, as well as the needs of high school youth for day, late afternoon, and evening programs on an economical and effective basis, since vocational education areas are concentrated.

B. Possible Limitations

1. Enrolls qualified youth in proportion to the understanding administrators and teachers have of vocational education and to the encouragement of qualified youth to attend. (This can be minimized through proper guidance and counseling and administration and teacher attitudes as evidenced by enrollments in joint vocational school districts.)
2. Limits extra curricular activities, since pupils change schools in the middle of their high school career, except for those who return to their district high schools.
3. Separates students enrolled in vocational education service centers from those completing their college preparatory programs in the district high schools.
4. Affects the entrance into certain colleges for a few students due to a lack of certain college preparatory offerings in the curriculum, such as foreign languages.

III. A vocational education service center combined with one of the district schools of the school system.

Under this organizational pattern, a vocational education service center, such as that identified in "II" above, would be attached to a district high school which would be offering the usual high school program including college preparatory, etc. Under this organizational pattern, students from other district high schools would attend the service center for vocational education purposes, and would remain attached to their own district high school.

A. Strengths

1. Provides effective use of expensive equipment and facilities.
2. Provides possibility for students participating in such vocational education service centers to take the required academic subjects at the vocational service center or in their district high school.
3. Provides administration by people highly qualified to direct vocational education activities.
4. Provides direct relationships with business and industry.
5. Serves the needs of out-of-school youth and adults as well as the needs of high school youth for day, late afternoon and evening programs on an economical and effective basis, since vocational education areas are concentrated.
6. Maintains relationships of vocational education students with students in college preparatory programs.

B. Possible Limitations

1. Leaves students from the district high schools other than those to which the service center is attached virtually in an "enemy camp" as concerns sports, extra curricular activities, loyalties, etc., unless they transfer to the district high school.

2. Affects the organization and operation of the vocational education programs by the more restrictive scheduling practices of the district high school programs.
3. Provides an atmosphere for the operation of the law of social gravity in which emphasis tends to flow toward the highest level of academic training, so that the vocational education programs become secondary citizenship.

IV. Offer some vocational programs in each district high school, with enrollment of students into these high schools on a full-time basis determined by interests, goals, and abilities.

Under this organizational pattern, students would enroll in their district high schools, and at the eleventh year they would be encouraged to transfer to and become a member of a district high school in keeping with their interests, goals, and abilities.

A. Strengths
   1. Maintains relationships of vocational education students with students in college preparatory programs.
   2. Develops loyalties and relationships within the one high school.
   3. Enables the school district to show on an overall basis a rather comprehensive vocational education offering.

B. Limitations
   1. Requires transporting students at times across town to a different district high school to enter an area of instruction of their choice.
   2. Serves inefficiently the needs of out-of-school youth and adults for preparatory vocational and technical education, retraining for the unemployed, related instruction for apprentices, and up-grading instruction for adults.
   3. Diverts attention from administration of vocational education programs, because the school is concerned predominately with academic facets of the school program.
   4. Restricts flexibility for vocational education curriculum, due to the many scheduling problems within a district high school.
   5. Leaves students from the district high schools other than those to which the vocational program is attached virtually in an "enemy camp" as concerns sports, extra curricular activities, loyalties, etc.
   6. Restricts in a sense the offerings in vocational education programs to those offerings within the school district because of the likelihood that students would attend their own district high school.
   7. Transfers pupils so frequently that they fail to establish loyalties, a necessary emotional state of belonging to or the satisfaction of identifying themselves with any school.

V. Offer some vocational education programs in each district high school with students enrolling in their school district and attending another district for vocational education, but remaining a member of their own district high school.

Under this organizational pattern, students would enroll in their district high school, and at the eleventh year would be encouraged to attend for vocational education purposes only, the district high school which offers the area of vocational education in which they are inter-

ested. The students would remain members of their district high school for purposes of sports, graduation, and extra curricular activities.

A. Strengths
   1. Maintains relationships of vocational students with students in the college preparatory program.
   2. Provides an economical comprehensive vocational education program, looking at the city as a whole.

B. Possible Limitations
   1. Serves inefficiently the needs of out-of-school youth and adults for preparatory vocational and technical education, apprentices, and upgrading instruction for adults.
   2. Requires transporting students at times across town to different district high schools to enroll in the area of instruction of their choice.
   3. Diverts attention from administration of vocational education programs because the school is concerned predominately with academic facets of the school program.
   4. Restricts in a sense the offerings in vocational education programs to those offerings within the school district, because of the likelihood that students would attend their own district high school.
   5. Restricts flexibility for the vocational curriculum, due to the many scheduling problems within a district high school.
   6. Requires students from one district high school to be divided among several other high schools in terms of their educational goals
   7. Requires student enrollment in district high schools in which pupils have no loyalties and are not a part of the extra curricular activities.
   8. Leaves students from the district high schools other than those to which the vocational program is attached virtually in an "enemy camp" as concerns sports, extra curricular activities, loyalties, etc.
   9. Provides an atmosphere for the operation of the law of social gravity in which emphasis tends to flow toward the highest level of academic training, so that the vocational education programs would become secondary citizenship.

In considering any organizational pattern, the following principles should be considered:

1. The organizational pattern should provide for a comprehensive program of vocational education.
2. The pattern of organization should not force students to enroll in an "enemy camp", (i.e. a rival "comprehensive" school which they play in competitive athletics).
3. The pattern of organization should not establish impossible transportation systems.
4. The pattern of organization must have the support of administrators, guidance counselors and parents, and the acceptance by the teacher group.
5. The pattern of organization must provide for administration of the vocational programs by persons competent in the field of vocational education.
6. The pattern or organization must provide for freedom of scheduling essential in the area of vocational education without the straightjacket of the normal high school subject-centered curriculum.

7. The pattern of organization must be such as to provide for services to out-of-school youth and adults on a broad basis.

Technical Education

The most common organizational pattern for technical education and some of their strengths and limitations are described as follows:

I. A technical education center functioning in cooperation with an area vocational education center, both administered by one authority with one tax base for both.

Under this arrangement the local taxing authority is normally required to pay a portion of the building costs and operating costs. Such programs normally receive reimbursement from State and Federal agencies through the State Board of Education and/or a State Board of Higher Education. The technical institute programs in such joint ventures should be permitted to grant the associate degree for those programs meeting the standards of the State operating units.

A. Possible Strengths

1. One tax base and taxing authority for both the area vocational and technical education programs.
2. One board of education to administer the two programs.
3. Possible savings in administrative costs for direction and supervision.
4. Possible savings in costs of materials and supplies.
5. Dual use of certain expensive laboratory facilities and of certain common service centers, such as heating, cafeteria, laboratories, etc.
6. A service center providing a continuing education in non-baccalaureate degree education, starting with vocational education at the high school level, and with provisions for vocational and technical education of a preparatory and upgrading nature on the post-high school level.
7. One relationship with industry for programs in which their advice and counsel must be sought on a continuing basis.
8. Technical education becomes a premium program in this organizational pattern, since it is the unit of highest status.
9. Emphasis in technical education in this organizational pattern tends to remain focused on its purpose of preparing youth for entrance into technical employment rather than upon continuation toward a baccalaureate degree.
10. There is less chance for the programs to become inclined toward a duplication of the first two years of a baccalaureate degree program.
11. The administration of the program will be in the hands of people concerned with vocational and technical education rather than baccalaureate degree education.
12. The local control inherent in this organizational pattern will encourage adjustment of the programs to meet the needs of both people and business and industry.
13. Local funds assist with both the construction and operation of the program.
14. Technical education is placed within a reasonable driving distance of the homes of the students.
15. Due to local and State participation in the construction and operation, the cost of technical education to the student is maintained at a

reasonable rate.

B. Possible Limitations
1. The State Board of Regents is reluctant to approve the granting of the associate degree to any educational agency except those operating under the control of an institution of higher learning or operating under the direct administrative supervision of the State Board of Regents.
2. Under this arrangement technical education must be sold to students on the basis of the merits of a technical education program without the stimulation that occurs when students believe they are enrolling in a baccalaureate degree program.
3. Students from such programs will not automatically acquire baccalaureate degree credit, but, must have their credits evaluated by an institution of higher learning if they decide to go on to a baccalaureate degree program.
4. The present organizational pattern at the State level involving the State Board of Education and the State Board of Regents presents a problem of relationships when cooperative efforts of this type are established.

II. Technical Institutes

Separate technical institutes can be organized to provide for post-high school technical education. Under this plan, technical institutes become separate administrative units normally with the taxing authority separate from any other educational unit in a city, county, or counties covered by the technical institute district. Such technical institutes may be assisted financially and supervised by either a State Board of Education or a Board of Higher Education within a State.

A. Possible Strengths
1. The purpose of the institute is clearly in the area of post-high school technical education.
2. Under this plan there would be a single administrative organization.
3. The technical education program is the premium program in the institute, since it is the only program.
4. The administration of the program would be concerned primarily with technical education.
5. Relationships can be established with business and industry with regard to this facet of education.
6. The element of local control will encourage the adjustment of the technical education program to both the needs of people and the needs of business and industry.

B. Possible Limitations
1. Establishes a separate tax authority for the same tax base as that established for a joint vocational school district.
2. Requires an administrative organization specifically for this one type of education.
3. Certain of the laboratories needed for short periods of time are expensive for use for this one purpose only.
4. There is a duplication of certain laboratories and shop facilities included in a joint vocational school.
5. A curriculum developed with transferability in mind will likely not produce quality technical education.

6. There is a history of the desire of such technical institutes to become four-year degree granting engineering centers.

III. Community Colleges.

Community colleges are normally organized to provide: (1) transfer programs giving credit toward baccalaureate degree programs at universities and colleges; (2) technical education programs preparing people for para-professional occupations, which programs may or may not accrue college credit toward the baccalaureate degree; and (3) community service programs of an adult education nature. In such institutions both the transfer collegiate curriculum and the technical education curriculum lead to a granting of the associate degree upon the completion of a two-year program.

A. Possible Strengths
1. The community college is community oriented and will give careful consideration to the interests of people and of business and industry in the areas served.
2. The community college provides partial local financing for both construction and operation.
3. Technical education is placed within a reasonable driving distance of the homes of the students.
4. Due to local and State participation in the construction and operation, the cost of technical education to the student is maintained at a reasonable rate.
5. Costs of administration for a college transfer program and the technical education program are reduced by reason of the one administrative board.
6. Under this plan there would be a single administrative authority.
7. The program remains responsive to changing needs within the local area.

B. Possible Limitations
1. A curriculum developed with transferability in mind will likely not produce quality technical education.
2. The community college represents a separate tax authority which may be in addition to a joint vocational school district, and could be in addition to a branch university center.
3. Such community colleges may tend to grow into four-year collegiate institutions, in which cases the two-year technical programs receive less emphasis, since the emphasis tends to be placed upon the professional areas.
4. On the basis of the law of social gravity, finances and emphasis in a community college tend to move toward a collegiate transfer program, rather than a technical education program. Also, enrollment tends to follow the law of social gravity unless the students in the technical programs are pacified by the granting of baccalaureate degree credit for the curriculum completed.

IV. University Branches.

A university branch is a local part of a sponsoring university, but located in an urban area separate from the main campus. The purpose of

the university branch is to decentralize the lower division of instructional activities in a State assisted university. The university branch is tied to and administered by the parent university and the programs and standards are expected to be those of the parent university. The university branches in some States can legally offer technical education programs.

A. Possible Strengths
   1. Technical education students who change their goals and decide to pursue baccalaureate degree programs may find it easier to obtain recognition of course credits by the parent university.
   2. The status symbol attached to the university will tend to encourage enrollment of students into the programs, many on a part-time basis.
   3. The administration and funding of the branch is provided through the parent university under the direction of the State Board of Regents.

B. Possible Limitations
   1. The tendency in the branch is to organize technical education on the basis of courses offered in the lower divisions of the baccalaureate degree programs.
   2. If the baccalaureate degree standards maintained at the central campus are maintained at the branch, many students who could succeed in technical education will be denied entrance or be unable to achieve at an acceptable level.
   3. A number of students will enroll in the technical education curriculum on the basis of the status symbol of the university, believing they are enrolling in a university program. Such students will have little interest in preparing for a technical occupation upon graduation. A great number will enroll on a part-time basis and will never graduate.
   4. Most university branches are not adequately equipped with the necessary laboratories and shop facilities to provide for a sound technical education program.
   5. Finances available to a university and to a university branch will tend to flow to the programs of highest status, the transfer programs in the branch and the graduate programs on the parent campus.
   6. There is a tendency for programs in the university branch to be central campus oriented, with little direct contact in relationship with business and industry in the local area to be served, and close relationships with business and industry are necessary for the further development of sound technical education programs.
   7. Since the status programs are transfer programs, enrollment in the technical education programs would generally decrease as students feel that they are secondary citizens in relationship to the transfer programs.

V. Colleges and Universities.

Technical education programs operated by universities and colleges tend to have the same possible strengths and possible limitations as identified for the university branch.

Technical education will grow best if it is identified as a unique program, in a unit separate and apart from institutions offering transfer programs to universities and in a unit in which the students are not looked upon as second class

citizens. There is a tendency for technical education organized in relationship to a university to become perverted to the issuance of college credit for the baccalaureate degree.

Technical education in the community college also can be placed in a secondary citizenship role unless there is an intensive effort made on the part of the administration to promote enrollment in identifiable technical education programs and to maintain strong relationships with business and industry in relationship to the goals, curriculum organization, and staffing of the technical education programs.

CONCLUSIONS

Acceptance of the ideas or concepts expressed within this position paper would lead to the following conclusions:

1. Vocational and technical education are essential parts of the modern curriculum for public education.

2. Public education has a responsibility for and an obligation to vocational education for high school youth, out-of-school youth and adults, in terms of preparatory training, retraining, and upgrading instruction for employed workers.

3. The needs of youth and adults for vocational education suggest that a minimum scope of programs requires an enrollment of approximately 500 youth in a center for vocational education. An optimum program of vocational education can be reached with an enrollment of 1300.

4. Needs of out-of-school youth and adults for technical education and the needs of business and industry for graduates of such programs suggest a minimum enrollment of 500 post-high school technical students in order to achieve minimum scope of program.

5. Large cities of 200,000 or more normally have sufficient tax base and student base to provide for a comprehensive vocational education program. Several options are available to large cities in terms of adequate organization for vocational education, but the pattern selected must provide for comprehensiveness of the vocational program in keeping with the nature of the students and the community, and for continuing services to out-of-school youth and adults.

6. Most suburban and rural communities do not have sufficient student base or tax base to provide for vocational education unless such districts join together to provide sufficient student base and tax base to support a comprehensive vocational program.

7. In some sparsely populated areas, it will be impossible to provide even a minimum comprehensiveness of vocational program at the high school level due to the great distances between the school districts involved. In such cases, residential type programs must be considered, either on a high school basis or on a post-high school basis for both vocational and technical education.

8. Vocational and technical education programs are sound educational programs

> planned to serve the needs of people and of business and industry and deserve the full support of people concerned with the modernizing of the educational program throughout the Nation.

Just as nature deplores a vacuum and makes every effort to fill the vacuum, so society deplores a vacuum in terms of the needs of that society and makes every effort to fill such needs. Public education within the fifty States has a short time in which to accept its responsibility for the total student, including his preparation for employment, and the responsibility for continuing education for out-of-school youth and adults. Unless this need is met by the individual States such an educational program will be provided under the auspices of the Federal Government.